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Forest Service

United States Department of Agriculture

FS-261

Western Redcedar

An American Wood

Primarily a west coast species, western redcedar extends into northern Idaho and western Montana. An associate in many forest types, this long-lived tree attains its best growth on relatively moist sites. Although comparatively light in weight—average specific gravity 0.31—the wood is among the most durable of the native tree species; its reddish-brown color, straight grain, good stability, and excellent paint-holding ability make this a preferred siding wood. Practically all shakes and shingles are made of this wood. Other important uses are poles, grape stakes, and paneling.

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Western Redcedar
(*Thuja plicata* Donn ex D. Don)

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Distribution

Western redcedar grows from the coastal regions of southern Alaska south through the coastal ranges of British Columbia through western Washington and Oregon to Humboldt County, Calif. In British Columbia, the species grows east to the western slope of the Continental Divide and thence south into the Selkirk and Bitterroot Mountains of Idaho and Montana (fig. 1).

Western redcedar grows best on moist flats, terraces, gentle lower slopes, stream bottoms, moist gulches, and ravines. A northerly aspect is generally more suitable than a southerly aspect. Occasionally, redcedar grows on moderately dry and warm sites, but its growth there is poor.

On the Pacific coast, western redcedar grows from sea level to an elevation of about 4,000 feet. In the northern Rocky Mountain region of northeastern Washington, northern Idaho, and Montana, it is found at an altitude between 2,000 and 7,000 feet. Within the United States, redcedar is not commercially important above 3,000 feet in the coastal region or above 5,000 feet in the inland area. It rarely occurs in pure stands, except in small areas. Common associates along the coast are: western hemlock *(Tsuga heterophylla)*, Douglas-fir *(Pseudotsuga menziesii)*, Port-Orford-cedar *(Chamaecyparis lawsoniana)*, redwood *(Sequoia sempervirens)*, and the true firs (*Abies* spp.). In the inland area, its associates include western white pine *(Pinus monticola)*, Engelmann spruce *(Picea engelmannii)*, and western larch *(Larix occidentalis)*.

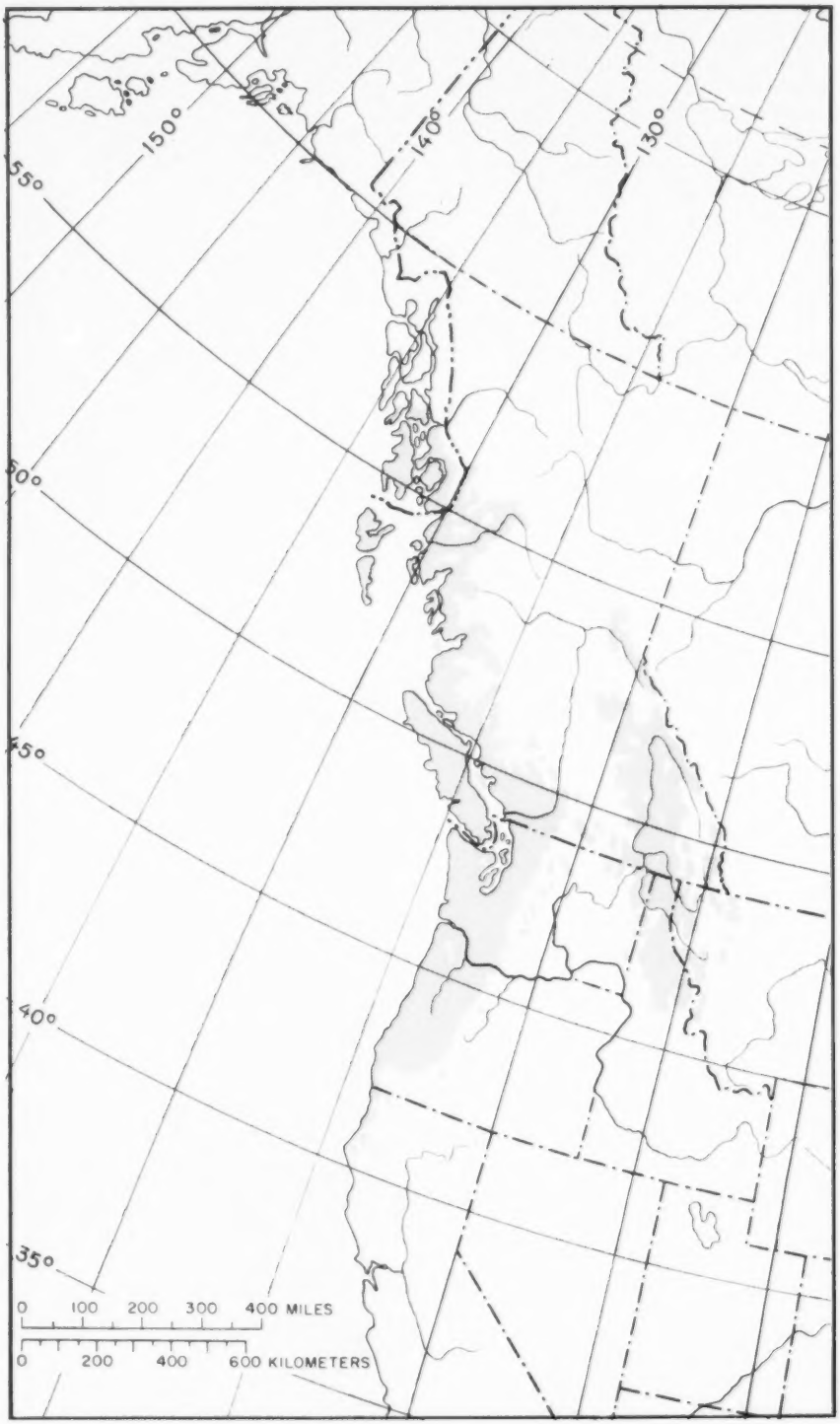

Figure 1—Natural range of western redcedar. F-532741

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Figure 2—Foliage and cones of western redcedar. F-521747

The hardwoods red alder *(Alnus rubra)*, big-leaf maple *(Acer macrophyllum)*, and black cottonwood *(Populus trichocarpa)* are often found with redcedar. A variety of lesser vegetation—mosses, ferns, herbs, and shrubs—is found on the forest floor under redcedar stands.

Description and Growth

Western redcedar is the larger of the two American arborvitae (the other is northern white-cedar *(Thuja occidentalis)*) and it grows to tremendous size and age. Under the most favorable growing conditions, cedar attains heights in excess of 200 feet and diameters up to 16 feet. In the northern Rockies, the larger trees are 175 feet tall and 8 feet in diameter. The trunk in older trees is buttressed, often fluted, and rapidly tapering. The crown is generally irregular, but full, with drooping branches that bend upward at the end to form a hook. The leaves are lustrous, dark yellow green in color, scalelike, and paired, or opposite, in four ranks (fig. 2).

The cones, small and egg-shaped, mature in one season, but remain attached to the twigs. When mature, the cones open into 8 to 12 paired woody scales. Western redcedar is a prodigious seed producer, with a 3-year interval between good cone crops. Seedfall begins in late August and extends throughout the winter.

The bark of western redcedar is generally about 3/4-inch thick, cinnamon red on young stems, and gray on older trunks. The bark is divided into thin, fibrous, interlacing ridges (fig. 3). The fully developed root system and large buttresses make western redcedar relatively windfirm, but its shallow roots make it susceptible to fire kill.

Western redcedar is very tolerant of shade, growing better than most of its associates. This characteristic enables it to become established wherever conditions are favorable. It is usually a member of the climax plant community.

Common Names

Western redcedar is known by several common names, including giant arborvitae, arborvitae, canoe-cedar, shinglewood, Pacific redcedar, giant cedar, and cedar. It is often confused with Port-Orford-cedar and incense-cedar *(Libocedrus decurrens)* where their ranges overlap.

Supply

There is about 44 billion board feet of western redcedar sawtimber on commercial timberland in the United States, with Oregon and Washington having more than half this volume. The volume is distributed as follows: Washington, 19.1 billion board feet; Idaho, 8.8 billion board feet; Alaska, 7.4 billion board feet; Oregon, 6.4 billion board feet; Montana, 1.6 billion board feet; and California, 0.1 billion board feet. An estimated 8.7 billion cubic feet of growing stock occurs in these same States.

Western redcedar is almost always sold under its own name. However, it is often used interchangeably with Port-Orford-cedar, incense-cedar, and redwood.

Figure 3—Bark and leaves of western redcedar. F-309007

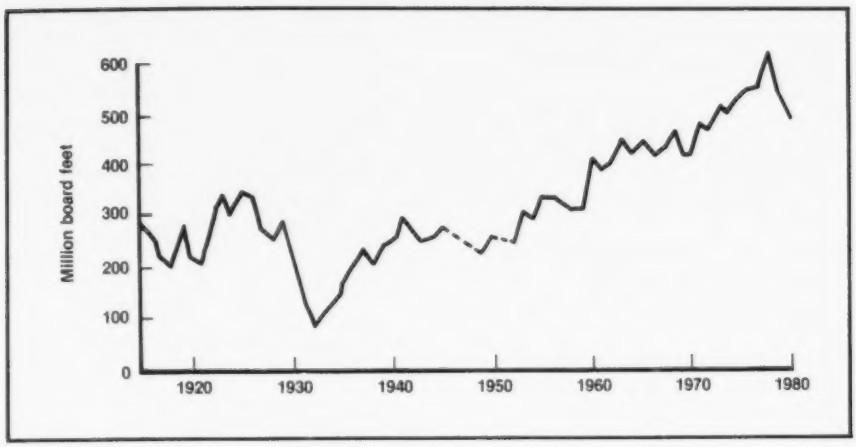

Figure 4—Western redcedar lumber production, 1915–80.

Production

Western redcedar lumber was produced at an average of about 250 million board feet per year from 1915 until 1952. From 1952 its production steadily increased, reaching about 626 million board feet in 1978 (fig. 4). There is no accurate estimate of the volume of western redcedar split products, but the species is the principal source of shingles and shakes. Fenceposts, rails, grape stakes, archery arrow shafts, and novelties are other split cedar items.

Western redcedar is widely used for telephone and transmission poles. Pole production fluctuates from year to year, but the range is from 125,000 to 175,000 poles annually.

There is no accurate estimate available of the volume of western redcedar manufactured into decorative plywood, but it is a significant amount.

Western redcedar has few insect enemies and suffers little from their damage. Three beetles that attack and occasionally kill trees are the western cedar borer *(Trachykele blondeli)*, amethyst cedar borer *(Semanotus amethystinus)*, and the western cedar bark beetle *(Phloeosinus punctatus)*. Diseases, likewise, play a relatively minor role in coastal redcedar stands, but are of greater importance inland. Yellow ring rot caused by *Phellinus weirii* is probably the most serious pathogen. Brown cubical buttrot *(Poria sericeomollis)* and white pocketrot *(Phellinus pini)* are other serious diseases. Younger trees are susceptible to winter damage, especially when severe cold waves occur during mild autumn weather.

Characteristics and Properties

The heartwood is reddish brown or pinkish brown to dull brown, and the sapwood is nearly white. The wood is almost always straight-grained, easily split, and has a uniform but rather coarse texture. It is light in weight, moderately soft, low in strength when used as a beam or post, and low in shock resistance. Its average specific gravity is 0.31, based on green volume and ovendry weight; its density is about 22 pounds per cubic foot at 12 percent moisture content.

Western redcedar is usually easy to dry, and dimensional changes are small. The wood is easy to glue and to work with tools. The heartwood is rated among the best softwoods in both paint-holding ability and natural durability against decay.

Principal Uses

Western redcedar makes fine lumber for decorative uses, especially interior wall paneling. Both knotty and clear grades are used for this purpose. In clear grades, it is one of the two most important lumber species for siding. Also, small quantities are used for window parts, pencils, and other manufactured products, including novelties. A quantity is used as a face laminate for roof decking. Other applications include caskets, wooden pipe and tanks, outdoor patio and greenhouse construction, and small outdoor structures where exposure to the weather is severe. It is considered one of the better boat- and canoe-building woods, being used mainly for planking. In thin veneers, it is the principal wood selected for covering racing shells. Western redcedar is a favored species wherever lumber is exposed to conditions favoring decay.

Nearly all of the sawn shingles manufactured are of western redcedar, as has been the case for nearly 70 years. In addition, split roof and siding shakes are frequently made from this species. The wood is also used for split products, such as fenceposts, fence rails, and grape stakes. Because of its natural durability, it is one of the preferred species for telephone and transmission poles. Butts of such poles are usually treated with a preservative to provide additional protection against rot.

Western redcedar is enjoyed by outdoor recreationists, especially in groves where the trees attain maximum size and grandeur. The species is also used extensively as an ornamental tree in landscaping.

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